

Ecological site F044BP906MT Subirrigated Cold Woodland

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General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

MLRA notes

Major Land Resource Area (MLRA): 044B—Central Rocky Mountain Valleys

44B Central Rocky Mountain Valleys

Major Land Resource Area (MLRA) 44B, Central Rocky Mountain Valleys, is nearly 3.7 million acres of Southwest Montana. This MLRA borders 2 MLRAs: 43B Central Rocky Mountains and Foothills, and MLRA 46 Northern and Central Rocky Mountain Foothills.

The major watersheds of this MLRA are the Missouri and Yellowstone Rivers along with their associated headwaters such as the Beaverhead, Big Hole, Jefferson, Ruby, Madison, Gallatin, and Shields Rivers. Limited portions of the MLRA are west of the Continental Divide along the Clark Fork River. These waters allow for extensive irrigation for crop production in an area that would generally be only compatible with rangeland and grazing. The Missouri River and its headwaters are contained behind several reservoirs used for irrigation water, hydroelectric power, and municipal water.

The primary land use of this MLRA is production agriculture (grazing, small grain production, and hay) with limited mining. Urban Development is also high.

MLRA 44B consists of 7 Climate based Land Resource Units (LRUs). Annual precipitation ranges from a low of 9" to a high near 24". The driest areas tend to be in the valley bottoms of southwest Montana in the rain shadow of the mountains. The wettest areas tend to be near the edges of the MLRA where it borders with MLRA 43B. Frost Free periods also vary greatly with from less than 30 days in the Big Hole Valley to approximately 110 days in the warm valleys along the Yellowstone River and Missouri River Headwaters.

MLRA 44B's plant communities are highly variable however are dominated by a cool season grass and shrub steppe community on the rangeland and a mixed coniferous forest in the mountains. Warm season grasses occupy an extremely limited extent in this MLRA. Most subspecies of Big Sagebrush are present, to some extent, across the MLRA.

Ecological site concept

- Dominant Cover: Forest
- Site receives additional water
- This site occurs on low terraces adjacent to flood plains of perennial or intermittent streams (though not in the floodplain), near springs and seeps, or other areas having a permanent or perched water table.
- Seasonal high water table within 40" (approx. 100cm) of soil surface.
- Moisture Regime: ustic
- Temperature Regime: cryic
- Elevation Range: 5500-6500
- Soils are
 - o Not saline or saline-sodic

- o Moderately deep, deep, or very deep
- o Typically less than 5% stone and boulder cover (<10% max)
- An area of dissected mountain valleys. The valleys are typically bordered by mountains trending north to south.
- Parent material is tertiary valley fill and recent alluvium
- Slope: 0-5%

Table 1. Dominant plant species

Tree	(1) <i>Picea engelmannii</i> (2) <i>Abies lasiocarpa</i>
Shrub	(1) <i>Alnus</i> (2) <i>Paxistima myrsinites</i>
Herbaceous	(1) <i>Clintonia uniflora</i> (2) <i>Linnaea borealis</i>

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Valley > Terrace
Elevation	1,676–1,981 m
Slope	0–5%

Climatic features

Table 3. Representative climatic features

Frost-free period (characteristic range)	4-21 days
Freeze-free period (characteristic range)	38-63 days
Precipitation total (characteristic range)	432-635 mm
Frost-free period (actual range)	2-32 days
Freeze-free period (actual range)	36-88 days
Precipitation total (actual range)	330-686 mm
Frost-free period (average)	14 days
Freeze-free period (average)	53 days
Precipitation total (average)	533 mm

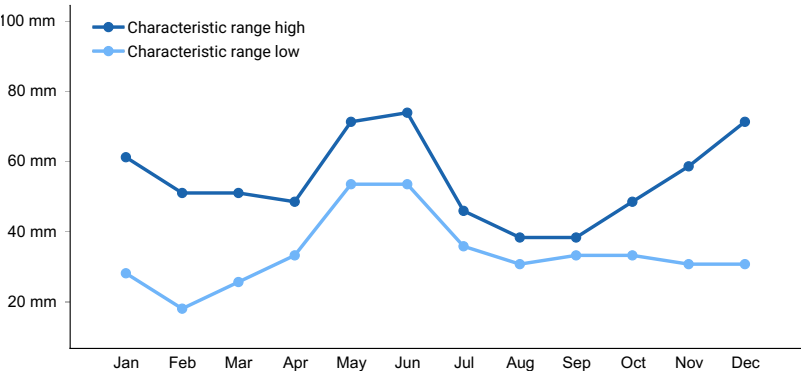


Figure 1. Monthly precipitation range

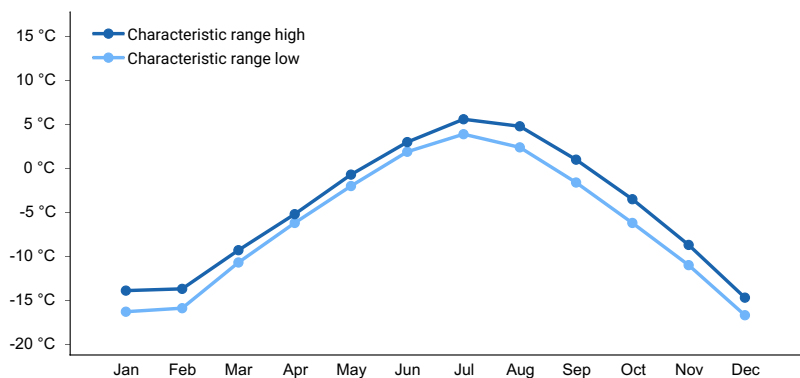


Figure 2. Monthly minimum temperature range

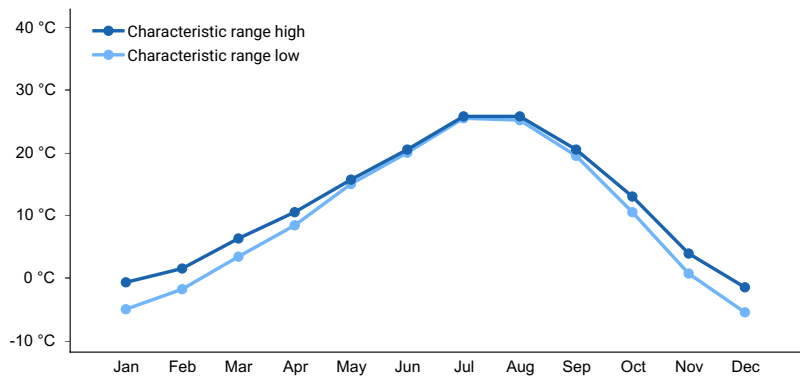


Figure 3. Monthly maximum temperature range

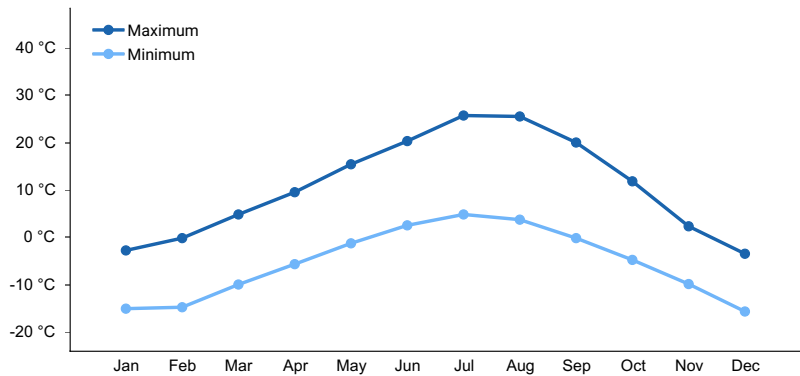


Figure 4. Monthly average minimum and maximum temperature

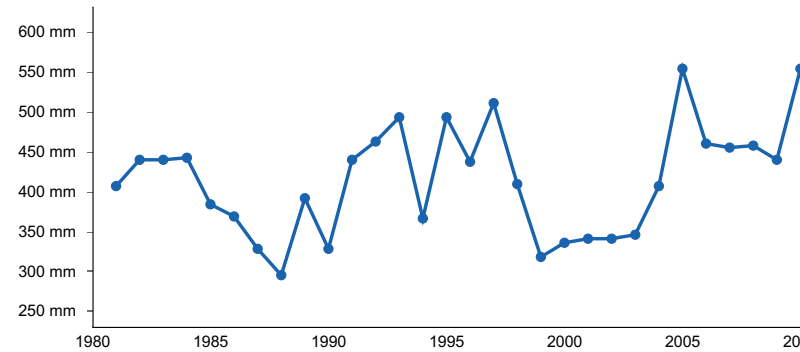


Figure 5. Annual precipitation pattern

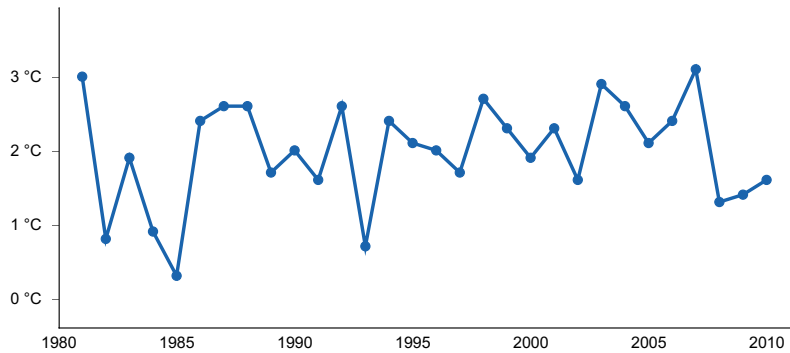


Figure 6. Annual average temperature pattern

Climate stations used

- (1) WEST YELLOWSTONE [USC00248857], West Yellowstone, MT
- (2) HEBGEN DAM [USC00244038], West Yellowstone, MT
- (3) BIG SKY 2WNW [USC00240775], Gallatin Gateway, MT
- (4) WISE RIVER 3 WNW [USC00249082], Wise River, MT

Influencing water features

Site is adjacent to floodplains of perennial and/or intermittent streams (though not in the floodplain), near springs and seeps, or other areas having a permanent or perched water table. Water table within 100cm of soil surface.

Soil features

Soil will exhibit signs of reduction and oxidation typically associated with hydric soils due to presence of water table

Table 4. Representative soil features

Parent material	(1) Alluvium
Drainage class	Very poorly drained to somewhat poorly drained
Surface fragment cover >3"	0–5%

Ecological dynamics

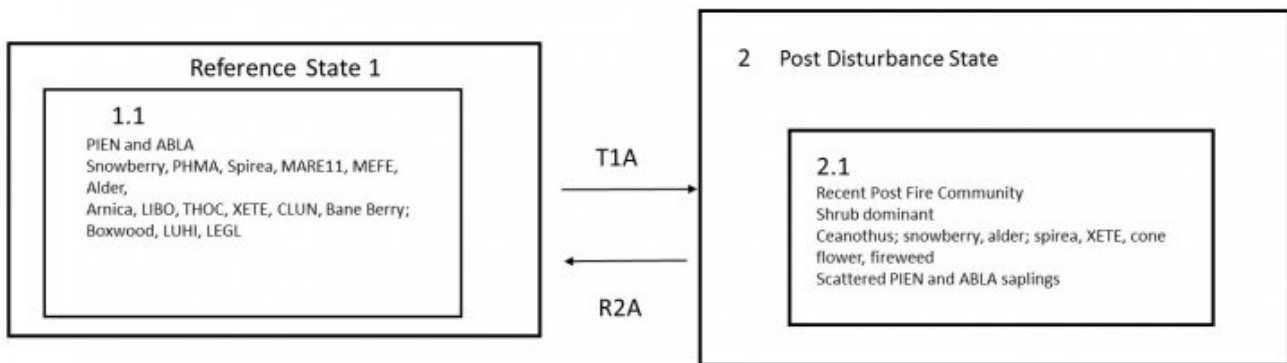
This Ecological Site contains two states; the Reference (1) and Post Disturbance (2). The reference state is defined by an Englemann's Spruce forest with Subalpine fir as a subdominant. The understory is primarily a shrub and forb community. The primary shrubs include snowberry, boxwood, alder, menziesia, and Oregon grape. The primary forb community includes heartleaf arnica, meadowrue, Queen's cup beadlily, and the occasional beargrass.

The Post Disturbance State (2) consists of primarily a shrub dominant community with saplings of Englemann's spruce and Subalpine fir. These shrubs are primarily alder, menziesia, ceanothus, and spirea. Fireweed and coneflower are the primary forbs of this community.

The Post Disturbance State (2) transitions to the Reference State (1) with time. Due to the growing conditions, this could take as long as 150 years.

State and transition model

44B Subirrigated Cold Woodland



1.1 Englemann's Spruce and Subalpine Fir dominated forest. Shrubs dominate understory canopy.

T1A Post Disturbance includes stand replacement fire (primary driver in this community), insect pestilence and disease. Fire frequency is long but fire is intense.

2.1 Shrub dominant condition post disturbance. Saplings of multiple trees present. Forbs increase in composition particularly colonizing species like fireweed and coneflower

2.1A Time where trees start to re-establish

R2A Restoration pathway where the site, over time, without fire, insect pestilence, or disease moves back to the reference state. Englemann's Spruce with Subalpine fir comes back in and shades out the other tree species. This process can take over 150 years.

Animal community

This site offers wildlife habitat however offers little to domestic livestock

Wood products

Site is not suitable for wood product and often falls within riparian buffers rules as per Forest Management Best Management Practices

Approval

Scott Woodall, 8/26/2019

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**
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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

Dominant:

Sub-dominant:

Other:

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**
-

14. **Average percent litter cover (%) and depth (in):**
-

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**
-

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**
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17. **Perennial plant reproductive capability:**
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